

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1849.—VOL. XLI.

LONDON, SATURDAY, JANUARY 28, 1871.

PRICE FIVEPENCE.
PER ANNUM, BY POST, £1 4s.

Original Correspondence.

BIRMINGHAM AND THE BLACK COUNTRY—No. VI.
THE BLOOMFIELD IRONWORKS.

The last article concluded with a description of the mills at the Bloomfield Works proper. Near No. 5 forge there is a small vertical engine, having a cylinder 14 in. in diameter, and working a stroke of 2 ft. 6 in. Driven from this are two roll-turning lathes, a large boring or turning lathe, and a punching and shearing machine, in which the boiler-plates used for repairing the works boilers are prepared. This latter engine does not, of course, work all these machines at the same time, for it is not necessary, consequently when one is at work the others are standing. The steam for the engine driving this machinery is supplied from No. 5 forge engine boilers. A small high-pressure beam-engine, having a cylinder 10½ inches in diameter, and working a stroke of 2 ft. 10 in., drives a roll-turning lathe, situate near the guide-mill. The steam for this engine comes from No. 2 forge engine boilers.

The Factory Works are the next in point of size to the Bloomfield Works proper, and are situated some few hundred yards from them on the outskirts of the town of Tipton. Two forges and a merchant-mill, comprise these works. In the first forge there is a beam-engine, having a cylinder 33 in. diameter, and working a stroke of 7 feet; 65-horse power. Two boilers supply the steam. A large helve, a forge train consisting of two sets of rolls, and a pair of shears are driven from the above engine. There are thirteen puddling furnaces and one ball-furnace. The merchant mill is driven by a condensing beam-engine, having a cylinder 37½ in. diameter, and working a stroke of 7 ft.; 84-horse power. The steam is supplied from three large boilers. Besides the merchant-mill there is a "bull-dog" crushing-mill, and two pairs of shears. There are two heating-furnaces. The second forge engine has a cylinder 18½ in. diameter, and works a stroke of 3 ft.; 15-horse power. One boiler provides the necessary steam. This is a high-pressure beam-engine, and it drives a large helve and a roll-turning lathe. There are twelve puddling-furnaces.

The Tipton Green Works are situated almost in the centre of the town of Tipton, and in them there is a forge and a merchant-mill. A condensing beam-engine, having a cylinder 30 in. in diameter, and working a stroke of 4 ft., drives the forge machinery. Three boilers supply the steam. The horse-power of the engine is 64. In the forge there is a large helve, and a forge train, consisting of two sets of rolls. There are also twelve puddling-furnaces, and one ball-furnace. A high-pressure beam-engine, having a cylinder 20 in. in diameter, and working a stroke of 2 ft. 8 in., drives the merchant-mill and two pair of cropping shears. The horse-power of the engine is 28. There are two heating-furnaces.

At the Bloomfield Works proper there are two foundries, in which the castings are made for the works. The iron is melted in two air-furnaces, one to each foundry. There is also small wrought-iron cupola, but it is seldom or ever used. A small staff of engineers or fitters are kept at these works, who do all the necessary repairs. A fitting-shop is erected, for the convenience of these men, in which there are several excellent machines. There is a planing-machine, three lathes, two of them screw-cutting, two drilling-machines, and a screwing-machine. The whole of these are driven by a small vertical engine, having a cylinder 8 in. diameter, and working a stroke of 1 ft. 3½ in.; horse-power, 3. The steam is supplied from one small boiler. In the stables are two small coupled engines, having cylinders 8 in. diameter, and working strokes of 1 ft., the steam coming from one boiler. These are used for cutting chaff, and for raising cast-iron balls, by which old castings are broken, so that they may be used in the air-furnaces.

From the particulars we have given it will be seen that there are 18 steam-engines, 38 boilers, 8 forge trains, 9 hammers or hammers, 95 puddling-furnaces, 10 rolling-mills, and 20 heating-furnaces, besides other machinery and erections, all employed in the manufacture of wrought-iron; and, as before stated, the quantity of iron that can be produced weekly is 1200 tons. Charcoal iron is made at Bloomfield, and for this purpose there are two furnaces, in which the scrap-iron used is heated with charcoal, stimulated by blast, and afterwards taken to the hammer, to be shaped into a bloom.

The gas used on the premises is made at the works, a small complete apparatus having been built for that purpose. The Bloomfield works have been built piecemeal, and the greatest efforts have been made to economise space, so that they are somewhat irregular, and yet are so well managed, that when in full operation the slightest confusion is not discernable. The order in which the machinery is kept is creditable to all concerned, for although this is one of the oldest ironworks in South Staffordshire, it cannot be branded with the stigma so often placed upon the works of this district. It is a common occurrence upon entering works, that have not stood half the time those of Bloomfield have, to find the engines out of truth, with the brasses all loose. Anything that can work will do. The proprietors do not seem to regard the extra power they have to supply to overcome the unreasonable amount of friction, as the steam is generated in furnace boilers heated by waste heat or gases of the puddling or heating furnaces. Then, as to the other machinery, the gearing is rough and heavy, no attention having been paid to the fitting of it, the rolls are mostly out of line, and the necks of them oval, the standards or housings skewed and shakey on the bed-plates, and the rolls joined together, with coupling-boxes and spindles fitted together, in the worst possible fashion.

This is a true picture of many of the South Staffordshire ironworks, and we have to congratulate the Messrs. Barrows that their works, although classed amongst the oldest in the district, are kept in admirable order. It shows what can be done, and there is no doubt that great benefit is derived from this orderly system, for it is impossible to get on smoothly with the work, and turn it out true, when the machinery is so bad, and in many instances 50 per cent. of the power supplied has to be exerted to turn the machinery alone.

In these works there are several horizontal boilers, heated by the furnaces: they are a great improvement upon the vertical boilers, which are too large in diameter; in them most of the heating surface is vertical, and therefore not near so effective as horizontal surface. Then as to safety: the horizontal boilers are much easier examined or

inspected; and this is very necessary, as furnace boilers are subjected to high and very variable temperatures.

COLLIERIES IN DURHAM AND NORTHUMBERLAND, THEIR WORKINGS AND MACHINERY.

STELLA COLLERY.—The Stella Coal Company (Messrs. Addison Potter and Partners) have here two establishments at which coal is raised—the Addison Pit and Emma Pit—of which Mr. J. B. Simpson, one of the partners, is the mining engineer. The royalties attached to the colliery are about 5000 acres in area; the chief one, known as the grand lease royalty, has been worked for several centuries in the upper seams. There still remain large areas of the Townley, Five-quarter, and Brockwell seams yet unworked. The great 90-fm. dyke runs through the royalty, and has been proved to be only 60 fms. of downthrow to the north at this point of its course, whereas at Gosforth Colliery, about six miles eastward, the throw is ascertained to be about 170 fms.

The ADDISON PIT is situated at the dip side of the property, and in proximity to the Newcastle and Carlisle Railway. The plant has been erected about seven years, and comprises a winding-engine, pumping-engine, ventilating fan and engine, eight screens, workshops, gasworks, and coke-ovens, &c. In putting down new plant the most approved form of engines should be adopted, keeping in view efficiency and economy; the same principle should be applied to the particular means of ventilation adopted; this guiding rule has been followed at Stella, and attended with very satisfactory results. The Addison coal pit is 10 ft. in diameter, 47 fms. in depth to the Brockwell seam, and is the means of ingress for air. The pump-shaft is 8½ ft. in diameter, 20 yards distant from the former; it is closed at the top, and serves as the return air-pit to the ventilating-fan. The winding-engine has one 24-in. horizontal cylinder, 5 ft. stroke, direct-acting, 12-ft. cylindrical drum, fly-wheel and foot-break on under side, two eccentrics, slot link, and slide-valve. The cylinder is enclosed in a metallic jacket; the latter is covered with felt and cleaded. This engine was made at Elswick Works in 1864; it raises about 480 tons of coal per day, from a depth of 47 fms., with two-decked cages, two 6-cwt. tubs in each cage.

The pumping-engine is a direct-acting, condensing, three-valved, Bull engine, of 52½-in. cylinder, 7½-ft. stroke, 20 lbs. steam pressure, acting on the under side of the piston; a vacuum of 12 lbs. is maintained. The cylinder has a metallic jacket; the steam, equilibrium, and exhaust valves are double-seated. The engine is from Messrs. J. Musgrave and Son's Works, Bolton. Water is raised in two lifts from the depth of 60 fms.: the lower lift is 20 fms., 20-in. bucket; the upper lift is 40 fms., with 20-in. forcing-ram, 7½-ft. stroke. The engine goes day and night, at the average rate of 23 strokes per minute, raising about 250 gallons per minute; the quantity does not vary much in the different seasons. A jack-engine, with 9-in. horizontal cylinder, shear legs, main and tail crabs, are erected for occasional use with the pump-work. Three Cornish boilers are fixed, two of which are in use at one time, 30 ft. by 6 ft. in shell; tube, 3 ft. at the fire, and 2 ft. 6 in. beyond; these supply the four engines (including the fan-engine) with steam at 40 lbs. pressure. The boilers are completely covered with sand, 1 ft. deep at the crowns, and are roofed over; they afford remarkably economical results in fuel, boiler space, and labour, in comparison with most North Country boilers, in which a reckless expenditure of fuel, caused in many instances by its cheapness, and a disregard for the preservation of the boilers, and of saving steam after it is generated, is the rule. This discredit to engineering it would be well to have amended at once. The ventilator for the mine is a Guibal fan, 16 ft. in diameter, 4 ft. in width; it is placed 8 yards from the pump-shaft, having an arched passage of communication, 36 ft. in area; the fan is driven usually 50 revolutions per minute, producing a circulation of 36,000 cubic feet of air in the mine, with 4-in. water-gauge. The driving-engine has one 8-in. vertical cylinder, 15-in. stroke, direct-acting, one eccentric and slide-valve; 2-in. steam-pipes are brought to a receiver near the engine, both receiver and cylinder are felted and cleaded. The fan and engine have been in operation five years, without cessation in their work, excepting an hour or two at the end of each week for cleaning or repairs. No attendant is required.

Three seams of coal are worked at Stella—the Townley seam, at 15 fms. depth, consisting of Cannel 6 in., coal underneath 3 ft. 8 in., producing gas-coal; the Five-quarter seam, found at 30 fathoms, is 3 ft. 8 in. in sickness; the Brockwell seam, found at 44 fms., is 4 ft. 2 in. in thickness, including 9 in. of splint at the bottom, which is separated from the other coal for steam purposes; the two latter seams are sold for gas or house purposes; the small coal of the three seams is mixed together for coke-making. There is but a slight production of gas from the coal in these mines, so that there is no cause for anxiety on that head. The coal is worked altogether on the bord and pillar system; the pillars are sometimes made 30 by 10 yards, in other cases 20 yards square; the latter are worked away by 5-yard lifts from the walls. Lamps are used only in pillar working; in the Townley seam this is not required. The rise of the measures is about 1½ in. per yard westward from the Addison pit; there is a similar rise eastward from the Emma pit, forming a ridge about midway between them, but the general rise of the measures is here (as it is further south) westward. The conveyance of coal underground is effected by ten self-acting inclines, and 22 horses. The coal from the upper seam is dropped down to the Brockwell seam. At the bottom of the pit, and along the principal roads, gas lights are placed.

The heapstead and screens are of wood, the platform being 21 ft. above the rails. Eight screens are erected, which are inclined alternately in contrary directions, thus economising space. The coal is separated into the two classes—large and small. Four lines of rails are required under the screens; the empty wagons are taken up beyond the screens by a tank locomotive, with 9-in. cylinders; they fall by their gravity to the different lines, as required. One hundred and forty-four coke ovens are built near the Addison pit, in double rows, dome shaped, 11½ ft. in diameter, with main flues and eight chimneys, 60 ft. in height. With the exception of ten these are all patent bottom-flued ovens, having nine flues in each; this form of oven has been in operation here four years. The ovens are charged at the door. The coke is drawn by hand. About 1200 tons of coke is produced per week; this is sent to the Harrington and other Cumberland works

for Bessemer steel manufacture. The coke contains only 2·75 per cent. of sulphur, and about 5 per cent. of ash.

EMMA PIT.—This is situated 1½ mile west from the Addison pit, and is 11 ft. in diameter, 68 fms. in depth to the Five-quarter seam; coal workings commenced in 1844. The pit is divided by wood brattice into two sections; the larger (7 ft. of the whole) is for coal work, and the inlet for air; the smaller section is appropriated for the pumps, and is the ventilator for the Townley and Five-quarter seams, being heated by a furnace near the bottom of it. The winding-engine has one 24-in. vertical cylinder, 5-ft. stroke, cast-iron levers, two eccentrics, slot-link and slide-valve, 11-ft. cylindrical drum and fly-wheel; these are supported on one side by wood framing; the cylinder is felted and cleaded. About 450 tons of coal is raised per day from the levels of the Townley and Five-quarter seams respectively, with two-decked cages, two tubs in each cage. The pumping-engine is a double-acting non-condensing double beam engine, with 44-in. cylinder, 6 ft. 8 in. stroke, four double-beat valves, worked by two cataracts and four weigh bars or spindles; the cylinder is felted and cleaded. An elevated pumping-beam extends from the pit to a staple sunk under its back end; a connecting-rod from the outer end of the main beam attached to the back end of the pumping-beam gives motion to the latter. Water is raised in two lifts from the depth of 70 fms.; the lower lift (in the pit) is 35 fms., 18-in. forcing ram; the upper lift (in the staple) is 35 fms., 18½-in. bucket; the stroke in each lift is 6 ft. 8 in. This engine goes day and night at the average rate of six strokes per minute, at 75 gallons per stroke, the delivery will equal 450 gallons per minute. During 24 hours the engine will raise 64,800 gallons, or 2880 tons, of water, equal six times the weight of coal raised. Two Cornish boilers, 30 by 6 ft., and three plain boilers, 28 by 5½ ft., supply three engines (including a wagon engine) with steam at 35 lbs. pressure; these are roofed over, the plain boilers will be replaced by Cornish boilers. An engine, with 9-in. cylinder and vibrating beam, is used for hauling wagons from the bank foot up beyond the screens, from which they descend by gravity on the different lines of rails to the screens; this is also used as a jack engine. Main and tail crabs and shear legs are erected for pump work. Eight screens are erected; these are inclined in contrary directions alternately. The underground conveyance of coal is effected by 10 self-acting inclines and 18 horses. There are small workshops and gasworks at this pit; at the bottom of the pit gas light is used. A granary also is erected, containing a mill for crushing oats, beans, peas, and maize, used for horses' food; the mill is driven by one of Clayton and Shuttleworth's portable engines. The coal from the Emma pit is conveyed by the Stella Coal Company's private line of two miles to Stella staiths, where it is shipped into keels, to be afterwards transhipped into larger vessels; it is sent by public railway to the docks at Jarrow and other places.

THROCKLEY COLLERY.—The present coal pit, 12 ft. in diameter, and pump-shaft 9 ft. in diameter, were commenced sinking in 1867, and coal work in 1869. They were sunk through the Townley, Main Coal or Five-quarter, and the Brockwell seams, all of which are now worked and raised from their respective levels; the pits are 56 fms. in depth to the Brockwell seam. The Throckley royalty is about 1000 acres in area, and is leased from the Lords of the Admiralty. After considerable working of the Townley seam by the old miners it had been suspended for upwards of 100 years, until its resumption in 1867 by the Throckley Coal Company (Messrs. Spencer, Stephenson, and Company), with Mr. J. B. Simpson, one of the partners, as chief engineer. Leases of this coal field are still preserved, dating as far back as the year 1600. From its proximity to the River Tyne, and the slight depth of the upper seams, this was probably one of the earliest coal mines worked for the shipment of coal to London and the coast. There are numerous old pits on the property. On the re-opening of the mines by this company, four years ago, some persons confidently asserted that no coal would be found; however, the pits have been put down, and after much difficulty with the feeders of water, large tracts of pillars and some whole coal have been found of excellent quality in the Townley seam. The main coal was found only partially worked, and the Brockwell seam entire. The pits were fortunately put down through a piece of solid coal in the Townley seam, and as the old workings were known to be filled with water the explorations in the coal were made in the first place cautiously by boring, with three bore-holes in each leading place, in the ordinary manner; the water by this means was tapped and discharged in regulated quantities suited to the capabilities of the pumping-engine. The old pillars in the Townley seam are found 20 yards by 6 or 7 yards in width; the bords 3 to 4 yards in width; these are mostly standing open, without signs of "creep," which may be accounted for by the slight depth of superincumbent strata and the pressure of water so long accumulated in the workings.

The winding-engine has two 18-inch horizontal cylinders, 4-feet stroke, direct-acting, four eccentrics, slot links, and slide-valves, 10½-ft. cylindrical drum. About 250 tons of coal is raised per day, with two-decked cages, two 6-cwt. tubs in each cage; but this quantity will soon be much increased as the mines are developed. The pumping-engine is one of the patent overhanging beam-engines, by A. Barclay, Kilmarnock. The cylinder, placed on the side of the pump-shaft, is 70 in. in diameter, 8 ft. 4 in. stroke; the beam, of wrought-iron, is supported on a vibrating pillar at one end, and projects over the cylinder at the contrary end, giving a stroke of 10 ft. in the pumps. The engine is single-acting, the pressure acting on the under side of the piston. The cylinder is enclosed within 9-inch brick wall, and 4 inches of clay within the brickwork. Water is raised in two lifts in the pit; the lower lift is 25 fms., 14-in. bucket, the upper lift is 44 fms., and 25-in. forcing-ram; it makes 2½ strokes per minute in day-time, and 3 strokes in night-time. While draining the old workings its rate of going was 6 strokes per minute; on the calculated quantity of 212 gallons per stroke, the delivery would be 1272 gallons per minute.

The ventilator for the three seams is a Guibal fan, 18 feet in diameter, 4 ft. wide, which is driven by a 9-in. horizontal direct-acting engine, with one eccentric and slide-valve; the fan makes 36 revolutions per minute, producing a circulation of 36,000 cubic feet of air per minute; the pump-shaft, closed at top, is the return air pit in connection with the fan. These engines are supplied with steam at 35 lbs. pressure from four Cornish boilers, 30 by 6 ft. in shell; these are covered with powdered clay and roofed over. The boiler-feeder is an 8-inch inverted cylinder, with 6-in. ram. Two firemen are employed by day, one at night time. The crab-engine has one

12-inch horizontal cylinder; it operates very powerfully on the drum by means of three motions of pinion and spur-wheels; the increase of power is in ratio of 1 to 36. Drum 6 ft. in diameter, which can be disconnected by a clutch and two other cog-wheels. The iron wire-rope used is $\frac{1}{4}$ in. in diameter; 22 coke ovens of the ordinary kind are built near the pit, of the dome shape, with main flue and chimney. Coal and coke are conveyed by the old Wylam Railway to Lemington staiths, where they are put into keels to be transhipped again below Newcastle into large vessels.

The Wylam Railway has been used for a very long period in the conveyance of coal from Wylam and other places. In 1813 Mr. Blackett showed the locomotive principle of traction to be practicable by trials on this railway, and locomotives on the Killingworth principle were afterwards adopted on it. A new railway is projected from Scotswood to Wylam, which, if carried out, will enable coal from this colliery to be shipped at Jarrow Docks.

THE LATE COLLIERY EXPLOSIONS.

SIR.—A witness having admitted in evidence at the inquest that a lamp must have been opened by a duplicate key to fire the shot which ignited the gas has induced me again to call the attention of colliery owners to my *Magnetic Lock*, which cannot be opened by the men. Lamps having this lock have been in full use at the Harecastle Colliery for the last nine months, and given the greatest satisfaction, and the men also now highly appreciate them, being impressed with the fact that they are put into their hands for their own safety.

Every information respecting these lamps will be readily given on application to the manager of the above collieries, to Mr. John Davis, lamp-maker, All Saints Chambers, Derby, or to myself.

Graving Docks, Victoria Docks, London. S. P. BIDDER, Jun.

THE RECENT COLLIERY EXPLOSIONS.

SIR.—In last week's *Mining Journal* there is an article on the explosions in Derbyshire and Staffordshire, containing several statements to which practical miners will altogether object. First, it is said, "In each case the firing of a shot preceded and led to the explosion." Now, the shot might precede, but as to the actual blast or fire of the shot, whether fast or loose, lighting the gas, we disbelieve. Also the theory advanced by Mr. E. Bainbridge, that "the blast caused by the expansion of the air through the firing of the shot was sufficient to fire the gas in a locked lamp." In practice we find it will do no such thing 60 to 80 yards away from the shot. For more than 20 years have we been in the constant use of powder, in coal and all kinds of strata surrounding it, but have never been able to light gas from the fire of a shot. Nor do the most heavy shots produce any serious expansion of the air a short distance off. You mention duplicate lamp-keys; the majority of the locks on the present lamps are a mere farce, any pick point, or the hook of another lamp, or a common small nail, is a key sufficient to lock and to unlock most of them, and are used almost daily at most places.

Walkden, Jan. 24. A MINER.

OIL v. GAS—MR. SILBER'S LAMP.

SIR.—The question of the application of Mr. Silber's contrivances for Lighting (as explained in the *Journal* of Dec. 3 and 31) continues to occupy the attention of the public journals and of scientific men. The process in Mr. Silber's counting-house is satisfactory to observers, but various practical difficulties are suggested, which may yet have to be encountered elsewhere. One of these is the question of uniformity of oil, and it may be said on uniformity of good quality of oil the success of a simple but delicate process depends. Unless a uniform good oil can be supplied, then the expected steady, clear light cannot be obtained, and the apparatus will be disturbed by the occasional use of inferior oils. Now, to use inferior oil will really render the use of the lamp impracticable, because an inferior mineral oil means a nuisance, to which few persons will subject themselves in a house.

Mr. Silber himself has been so far successful with oils used by him, on account of his extraordinary care in their selection; but it appears that absolute uniformity may be secured by the use of Messrs. Houghton and Howell's oils, manufactured by their patent process; and it is acknowledged that if a sufficient quantity of these can be obtained, then there must be a great extension of improved lighting.

The demand for the purified oil does not depend on Mr. Silber's or any other apparatus, but the success of such apparatus is ensured the moment it is ascertained that purified and uniform oils will be available. It is said that this desideratum is likely soon to be realised, as Messrs. Houghton and Howell's patented processes for the manufacture of petroleum will shortly be brought before the public; and such is considered to be the fame of the oils, both in England and America, produced by their improved mode of distillation, that orders, to an extent apparently unparalleled, are continually being pressed upon them for their burning and lubricating oils.

Mr. Silber's, or any other lamp which shall eventually lead to the general use of carbon oils, from which the poisonous compounds of arsenic and sulphur, in all their nauseous combinations, are thoroughly separated and removed by Messrs. Houghton and Howell's process, will not only be of great importance in a commercial point of view, but will also largely benefit the public health, which is too often gradually and insensibly undermined by the inhalation, in confined places, of those pestilential products of combustion. T. H.

London, Jan. 26.

NEW STEAM-STAMPER.

SIR.—In the *Mining Journal* of Dec. 4 a paragraph appeared setting forth generally the merits of a new steam-ore stamp, stated to be the invention of Messrs. Chatwood and Sturgeon, and for which the Royal Cornwall Polytechnic Society had awarded those gentlemen their first-class silver medal; and as those gentlemen are only the manufacturers, and are not the inventors or designers of the same, I beg you will insert this my correction of your report upon that point, observing that I am prepared at any time to prove from the correspondence of those gentlemen that neither of them either invented or designed the present new Steam-Stamper; and by other indubitable evidence that before either of them were made acquainted with any details, or the objects of the invention, the same had been matured and provisional registration effected.

You are, I presume, aware that an illustration of the same Steam Stamper, accompanied by a descriptive detail thereof, has since appeared in the *Engineer* of Jan. 6, to which I have been compelled to address myself, as I am not disposed to be ignored as well as deprived of my patent right, and also denied the honour where honour is due. It is hardly necessary to observe that the patent of those gentlemen is an invalid one to all intents and purposes, instead of, as it might have been, a most valuable one to all parties concerned.

London, Jan. 18.

W.M. SYNNOCK.

STEATITE.

SIR.—Noticing your reply to "H. G." (Walworth), in last week's *Journal*, respecting this (what I find a scarce) mineral, and being acquainted with Mr. Edmund Spargo I have more than once visited his quarry, which is situated on the island of Holyhead, about two miles from the Valley station, and in proximity to the great deposit of serpentine rock, in the parish of Rhoscolyn, so well known to geologists. This appears to be the only deposit in the island worth working. The quality, I understand, is of the finest description. I happen to have some pieces by me. I send you a sample of the stone, and also some in a fine powdered state, obtained by me from the sample stone sent. This deposit is so extensive that it can be quarried, carted, and delivered in railway trucks at Valley or at Valley port for about 3s. 6d. per ton. Mr. Spargo, to my knowledge, has during the last two years sold to one Manchester firm alone upwards of 200 tons. I understand the price per ton, as obtained from the quarry, varies from 2s. to 2s. 10s. at Valley. I hear, however, that he now contemplates erecting a grinding-mill on the spot. The value per ton of ground steatite of equal quality to the sample forwarded herewith would be from 5s. 10s. to 6s. delivered. Mr. Spargo would have a great advantage afforded him by grinding it, as at present his sales are necessarily confined to millers, who, in fact, reap the greatest share of the profits. Besides this, he would then be able to go to the market with the manufactured article; and as his quarry is probably more con-

veniently situated for transit either by sea or by rail, and the deposit itself equally or perhaps more extensive than any in Great Britain, he has great advantages over most places. Indeed, I never heard of any other in Wales of any importance; and I understand the deposit at Lizard Point, in Cornwall, is very limited, and found in small contemporaneous veins. Mr. Spargo could easily raise 300 tons a week, or even more; therefore, when he gets the mill to work I see no reason why he should not be able to supply the principal demand, and in fact secure the entire monopoly.

In addition to the uses of steatite named by you, the greatest amount is used in cotton factories for sizing, diminishing the friction of the machinery, polishing serpentine, marble, gypseous alabaster, in anti-friction pastes, and in the manufacture of the best fire-resisting crucibles. As cement it is used for lining iron safes and many other purposes. Mr. Spargo deserves every success; in fact, there can be no doubt as soon as he gets the grinding machinery up a most extensive sale will readily be found for it.

R. LL. I.

Anglesea, Jan. 25.

DYNAMITE.

SIR.—Some of your readers may like to have a practical opinion on the use of Dynamite for underground mine workings. I have recently had this explosive tried at two mines, and I have just received from one of the mine captains the following report:

"We have found it to be of great advantage in wet ground. It is much more powerful than powder, and water does not seem to affect it. In a mine so well ventilated as ours is, the noxious gas will do no injury. The men tell me that if they go in quickly after blasting they get a headache, so that I do not think it would answer well in a close mine."

This report seems to me to establish the superiority of Dynamite over gunpowder for mining purposes in those mines where the ventilation can be made sufficiently effective.

J. G. B.

London, Jan. 25.

MINING IN NEVADA AND CALIFORNIA.

SIR.—I was pleased to see in the *Journal* a letter from Mr. J. E. Bowe, with reference to the mine in Nevada formerly known as the "Bateman" Mine, to purchase which a company was formed here in the early part of last year, under the name of the "Champion" Company, by Mr. George Batters, but which, however, was allowed to fall through by sundry wisecracks, who preferred the testimony of a Cornish mining captain before that of men resident on the spot, and thoroughly conversant with the different characteristics of Nevada silver mines. The following paragraph, from the *Virginia City Enterprise*, will show what the mine—now called the "Eureka Consolidated," and owned by San Francisco capitalists—is doing:

"The Eureka Chronicle of Dec. 17 gives the results of the working of the Eureka Consolidated Company from Dec. 1 to Dec. 15—fourteen days. The amount of 428 tons of ore were taken from the mine and smelted at their furnace, producing 146 tons of bullion, valued at \$420 per ton. The total cost was \$9130, leaving a net profit of \$53,190."

A profit of 10,000^l. as the result of 14 days' work is not a bad return, especially when it is remembered that the mine is doing this month by month. It is, in fact (with the exception of my old love, the Chollar Potosi Mine, of Virginia city, which is distributing dividends to its shareholders of 27,000^l. per month), making larger profits than any mine on the Pacific coast. When will people learn to apply to mining matters a little of the common sense which they exercise in their ordinary business transactions? This is not the only instance by many of Cornish miners (good and reliable fellows they may be in their own county) being sent abroad to a country of which they know nothing, to report on gold and silver mines, of which they know still less, and this with hundreds of thousands of pounds depending on their fiat.

Mr. George Batters may fairly place the Eureka Consolidated to his credit, along with Van, Chiverton, and Sweetland Creek; and, by-the-way, I, claiming to know something of the uncertainty of mining speculations, venture to think that these three make a pretty good set-off against this much-abused gentleman's one failure—the Pacific Company.

A large amount of English capital—probably not much under a million sterling—is now invested in Mines on the Pacific coast. The largest amount is in the—

EBERHARDT AND AURORA, of which I have written in previous letters, and of which I hear that they are raising considerable quantities of good ore, ready, in California parlance, for a big "splurge" when the mill starts. They have also purchased another mine in White Pine, and one, too, that is turning out rich ore. The worst thing about the White Pine district is that the rich chloride ores are apparently superficial—so all my letters from men who have operated largely in the district tell me. It must be remembered by those who form extravagant notions as to what the mines will produce that they were only discovered about three years ago. During those three years the mines have risen to their zenith, any amount of capital has been devoted to their development, very rich ores have been taken out—the Eberhardt itself having been at one time almost Aladdin's palace—and to-day the district once so populous is, by comparison, deserted, and nine mills out of ten (to quote a letter recently received from there) are lying idle. However, the company is under most able local management, for if George Atwood cannot make a mine pay nobody can.

SOUTH AURORA.—Most of my remarks as above will apply to this company also. I must, however, confess that it is to me a bad sign when vendors, asking a large sum in cash, are afterwards ready to accept all they can get. They may prefer shares, but—Well, least said soonest mended, as the old proverb says.

SIERRA BUTTES.—This is, without exception, the finest and most permanent property on the Pacific coast which has yet fallen into English hands. Everything will depend upon the management, as the auriferous quartz is of low grade, but apparently inexhaustible. I have seen no reports published here, the company being, I believe, a private one. What I write is simply what I hear from California.

SWEETLAND CREEK.—A small, steady concern, which has already got into the dividend list, and which is likely to keep there for many years to come, if properly managed. The class of mines of which this is an example, called hydraulic mines, must eventually meet with great favour here. Cent. per cent. (and ephemeral) profits need not be looked for, but regular 10 to 30 per cent. dividends, varying with the richness of the gravel, the supply and cost of water, and general accessibility of the deposits.

ECLIPSE.—Wonderful news comes from this mine, but as I have so often seen in the gold lodes of California little rich argenterous bunches in intrusive cross bunches (they cannot be called cross-courses) of greenstone, here-to-day and gone-to-morrow, and as I never attach the slightest importance to assays of samples, the least I say about this mine the better.

PACIFIC.—Who shall say that "resurgam" is not written here. Meanwhile, according to all accounts, they are being done "brown."

TUOLUMNE.—On July 23 last I wrote you concerning this mine:—"Take for instance the assays from the mines of the Tuolumne Company, of which I know absolutely nothing,—put those assays (all perfectly true without doubt from the samples sent home) before any Californian in his sober senses, and see what he will say."

The result of the first run was, if my memory serves me, \$7 per ton—a wee egg out of so much a bird. My chickens seem to be coming home to roost sooner than I expected.

Two new companies have also appeared within the past few days—the "Atlanta Silver Mining Company" and the "Birdseye Creek Gold Mining Company."

The Times having brought its superior "intelligence" to bear upon these two embryo companies, I almost fear that in saying a word or two I am trespassing upon forbidden ground. First as to the—

ATLANTA COMPANY.—The names attached to this company's prospects are those of gentlemen who no one can for a moment suspect would put before the public what they did not themselves believe to be true. The question arises whether they are not allowing themselves to be led astray by wonderful tales and wonderful assays. Again the Cornish mine captain crops up. It is a long price for a mine, and a mine, too, possessing such a peculiar fascination for a San Francisco capitalist,—on which point more anon.

BIRDSEYE CREEK is not such a pretentious concern, but it has this much in its favour—that it is endorsed by men who are well acquainted with the class of mines proposed to be purchased, and whose opinion I at least, as an old Californian, would value more than that of all the English mining engineers put together.

The remarks I have made about Sweetland Creek apply with dou-

ble force to Birdseye Creek, as I understand that at Sweetland their water is costing them \$3000 a month, while at Birdseye their water will cost them nothing, and the latter has seventeen claims to the former's three or four.

THE "TIMES" ON FOREIGN MINES.—Before I conclude, one word in answer to the question put by the *Times* as to the reason why good mineral properties are brought to this country for capital to work them; and I will not do as the *Times* does in to-day's issue—quote the "rigging" carried on in Joint-Stock San Francisco companies in Nevada silver mines as a peg whereon to hang remarks on California gold mines, but will simply make a remark or two from my own experience in California.

1.—It is almost an impossibility to get a San Francisco capitalist to look at a gold mine in California, much less to buy it, unless it has a reputation such as is possessed by about half-a-dozen mines only in the whole State. Anything at a distance, no matter how far or how inaccessible, your San Franciscan will rush madly into, but a concern close under his nose at home—no, and any Californian will bear me out in this.

2.—You, a Californian, want to borrow money to work your mine, believing you have a good one—5 per cent. per month for the money. Who can stand that? And I have paid that rate on the Pacific Coast for the San Francisco company I represented month by month, on an advance of over \$100,000, and glad to get it at that.

3.—Your San Franciscan when you do persuade him to embark in a mine must see, or fancies he sees, dividends of 5 per cent. per month. We in this country are satisfied with 1 per cent. per month on a mining venture; so sometimes what is good for a Californian to sell is good for an English company to buy. The finest gold mine in California—aye, in the world—the "Eureka" of Grass Valley, was offered in London a year ago. It was paying good dividends then, but since that time it has paid only from 6000^l. to 10,000^l. a month dividends, and it was offered here at 250,000^l.—about three years' purchase, and with over three years' reserves in sight. According to the *Times* principle, this was also a swindle.

There are plenty of magnificent properties in California yet to be purchased by English capital, the *Times* notwithstanding. P. London, Jan. 25.

USE AND ABUSE OF THE TELEGRAPH—TAQUARIL MINE.

SIR.—We have lately received the following Telegram from the Taquaril Mine:—

"Stuff so far treated at stamps not rich; produce for month will, perhaps not realise expectations."

Now, Sir, the effect of this message has been the depreciation of the value of the mine from 50,000^l. to 60,000^l. Many of the shareholders were much alarmed, and sold their shares immediately, thinking the previous reports of the great richness of the mine were mere fiction, and that the truth of the matter was now coming out. Others imagined that they were stamping the debris from the old mine, which appears to be the correct version.

I think directors should instruct their agents to be more explicit in future when favouring us with telegrams. Mining shares fluctuate quite enough from the varying prospects of the undertakings, without the transmission of vague reports. A SHAREHOLDER.

TIN IN MUNDIC.

SIR.—Since I wrote to you my letter upon "Tin in Quartz and Tin in Elvan" my attention has been called to several notes in the *Journal* concerning the presence of tin-stone in mundic in certain districts in Cornwall. This appears, from all accounts, likely to prove as great a discovery as those alluded to in my former letter. During the last half-year I have submitted to analysis numerous samples of Cornish tin-bearing mundic, and the results have been highly satisfactory. I can give to those of your readers who are unacquainted with the processes of chemical analysis a simple method by which they can often render the tin-stone visible in these cases, especially when the gangue is of white quartz or killas.

About 15 grammes (say $\frac{1}{2}$ oz.) of the coarsely pulverised ore is treated with slightly diluted nitric acid, until the whole of the pyrites is oxidised and dissolved, which at a gentle heat will occur in four or five hours. About half a pint of water, or rather more, is then added to the flask which contains the substance, and by giving a rotatory motion to the liquid and the residue, and then allowing the latter to subside, the heavier tin-stone will invariably group itself into a little compact mass at the bottom of the liquid (best seen when the flask is inclined); over it lies the white quartz or green killas, and over this again the sulphur, if any remains undissolved, which is usually the case. When the stone thus treated contains 3 or 4 per cent. of tin oxide this little experiment shows its presence very distinctly. To ascertain its exact amount the ore must be submitted to a very careful assay, and as arsenic is mostly present in notable proportions, it is best to roast it previously to attacking it by the usual dry method.

I cannot help thinking that the discovery of tin-stone in the mundic of New Great Consols and Okel Tor Mines will be the starting point of some very interesting and unexpected facts that will tend to explain not only the origin of these deposits in Nature, but why tin is restricted to so limited an area on the earth's surface.

T. L. PHIPSON, Ph.D., F.C.S.

ANALYTICAL LABORATORY, PUTNEY, S.W.

THE METALS, AND THEIR ORES—NO. XV.—GOLD.

SIR.—In article No. XIV. some of the gold-producing countries of the world were mentioned. In the present paper I purpose referring to other equally important districts whence gold is derived. The continent of America at once arrests the attention, on account of its inexhaustible stores of the precious metal found in nearly every region from Cape Horn to Behring's Straits. There are, of course, some localities which are more prolific than others, and it is to these I shall more particularly refer. In South America, Chile, Buenos Ayres, Bolivia, Peru, Brazil, New Granada, &c., are proverbially known as gold-producing countries. In Chile gold is found in the decomposed granites, in quartz veins traversing the granitic and slate rocks, and likewise in metalliferous veins, embedded in the Silurian and more recent formations. Valparaiso, Coquimbo, Chaneral, Copiapo, and the burning plains of Atacama may be mentioned as some of the important mining districts of Chile, both with respect to gold and to other metals. The mountains of Peru abound in metallic wealth. In some districts, as those of Pataz and Huilas, the gold is obtained from quartz veins traversing the older rocks, whilst in others it is washed from the beds of rivers. In Brazil, and in New Granada and Panama there are important gold regions, and large quantities of the precious metal are obtained by washing the river sands. In North America, Mexico, with its vast quartz veins and "placers" traversing the prolific regions of Guanaxuato, Guadalaxara, Zacatecas, Guerrero, Chihuahua, &c., produces not only gold but nearly all the other metals in great abundance. Sonora, between Mexico and the Gulf of California, is another gold region but imperfectly developed, where, in default of lead, the Indians are said to make bullets from nuggets of gold. With regard to that marvellously rich auriferous district of California, bounded by the Sierra Nevada mountains on the east, and the Pacific on the west, and following the course of the rivers Sacramento and San Joaquin and their tributaries from north to south, it is needless to write, as from the day the first nugget was found by Sutter, whilst digging the water-course at Coloma, in 1848, the facts and figures relating to California gold digging have been as "household words."

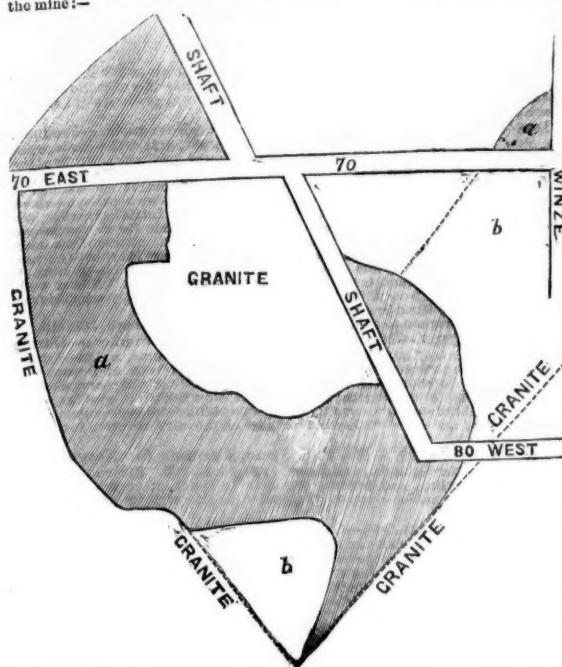
That which has been equally as important to civilisation and to California as gold mining is that which has sprung out of it—the building and peopling of magnificent cities, the

tensively worked for gold, the total production in 1869 from the Nova Scotian gold quartz crushings being about 20,000 ozs., the average produce being about 18 dwt. of gold per ton of quartz.
Mining Offices, Shrewsbury.

EDWARD GLEDHILL.

EAST WHEAL LOVELL.

SIR.—The following plan has been sent to me by one well acquainted with the above mine. It is drawn from actual measurement, and many inspections of the mine:-



a, represents the tin ground taken away—b, what remains to be taken away, and available for future dividends.

It will be observed that the winze sinking below the 70 is rapidly approaching the granite, as the 80 west is driven beyond the perpendicular, and the tin ground is dipping east, or away to the body of which is already taken away. The 80 east, which is supposed to be a level, is a stop, and cannot possibly be expected to continue, the granite having been seen above and below.

If any correspondent will give the shareholders further advice, corroborative or corrective of this plan, I shall feel indebted. The well belief of all interested in mining depends upon a full and fair statement of the truth.

H. WADDINGTON.

P.S.—Would any inspecting agent tell the shareholders whether there is in sight two more dividends of 2*l.* each in (say) the next six months from the last dividend.

EAST LOVELL, AND CAPTAIN PASCOE.

SIR.—Allow me a short space in your valuable Journal to express an opinion on this mine. Captain Pascoe has again and again inspected the property, and with all deference to any resident agent's opinion, any practical miner would be guided by the former as the latter. For the following reasons I would prefer Capt. Pascoe's or any other independent agent's opinion (not being myself on the mine, and able to get at the truth):—

Capt. Pascoe has reported from the first his fears, and given his reasons why the mine could not continue so rich—he predicted the falling off in the bottom of the 80. Did Capt. Quennell ever report this, and when? Have not his reports universally been of "great improvements," and "the mine looking more than ever?"

Does not Capt. Pascoe tell us that a hard bar of granite came in from the west, and completely cut out the tin, barely leaving the trace of a vein in the bottom end of the shaft, and that the said end, called the 80, is now 2 fms. beyond the perpendicular of the winze sinking below the 70, thereby proving that this winze is all but bottomed? What has Capt. Quennell said anything of this?

Capt. Pascoe and all other independent agents tell us that had not this rich spout of the kettle been found, no dividend would have poured forth for a long time.

The winze sinking below the 70, valued so highly as 70*f.* per fathom, is very rich for 4 or 5 ft. in length, but not the whole length, and is fast dipping east, clearly proving that as the so has passed under this, there really is nothing on which we can look with confidence to the future.

At the Puffer shaft they have had a most accommodating lode. About four weeks ago, on an inspecting day, the lode was valued at 20*f.* per fathom; the following day at 10*f.* per fathom, the report being received in London on Friday morning. Next inspecting-day (a fortnight from last), the lode is again valued at 20*f.* per fathom, and inspectors shake their heads when asked if there is any appearance of its ever having been worth more.

Ought confidence to exist where but the bright side is ever painted? Where we hear of no failing off, but where every little improvement is looked at through a large microscope? Where failures are never published, but the ignorant left to their bliss? Is it that the agent himself has no confidence, and balls with delight every little flicker of his night-light, ere it is eclipsed by the excavations of the disappointed?

My local correspondent, writing on this mine, says, referring to the winze sinking below the 70—"It has come in right good time to save them; and it may do very well for those who know the ropes, but not for outsiders."

The price of shares have ruled high—far beyond their value; so did the South Sea Bubble; so did many bank shares in 1865, all from the same cause—the collapse as certainly is coming. Let those who would not be left behind send a trustworthy agent to confirm or refute these statements.

A LOOKER-ON.

Jan. 25.—P.S.—Would anyone interested inform the public whether the water will be in the bottom of these shafts and winzes soon—that is, when the tin is gone? What tin is being sold now? Have the shareholders been told they no longer sell 1 ton per day.

EAST CARN BREA, AND ITS MANAGEMENT.

SIR.—I cannot understand what motive a "Late Shareholder" can have in now interfering with the affairs of this company, unless as the tool of some disatisfied or unprincipled adventurer, and, as his letter does not contain facts, I beg your insertion of my reply thereto. I have no doubt there are parties who will undertake the management of this or any other mine in this district for a few guineas per month; but, having had some experience in the weaknesses of cheap agents, I would urge upon the shareholders not to be led away by such statements. I know that the secretary has increased his interest in the mine, and think it ought to show the shareholders the great faith he (as the representative of the company) has in the concern. I happen to be perfectly aware of the circumstance under which he has acquired a large stake, and we all should be thankful to him for supporting the mine by preventing wholesale relinquishments, while since the transfer of a large number of shares has unfortunately, but not unexpectedly, been the order of the day. I am assured that Mr. Buckley never had the least intention of obtaining his proportion of the assets, and, on the other hand, he has subscribed hundreds of pounds, and is still willing to prosecute the mine. As to the merits of the mine, I maintain that there is a general feeling in the district in favour of a vigorous development of the property, and upon this point I think the opinion of Capt. Hosking, of Carn Brea, should be taken as conclusive. The great reduction in the number of shares entailed heavier calls, but a project is now on foot for bringing new blood into the concern by an issue of all forfeited and relinquished shares, and placing the mine under the Limited Liability Act.

A SHAREHOLDER.

EAST CARN BREA.

SIR.—It is with regret I ask you for space in the Journal to reply to Mr. Laws' letter of last Saturday. I am bound, however, to do so, in justice to those whose interests I represent. It has been my disagreeable duty to contradict Mr. Laws time after time, in open meeting, so much so that I have come to the conclusion that the two long words, "unscrupulous" and "insidious," are so essentially the elements he has found answer his purpose, that in the brilliancy of his intellect he confuses an open and fair expression of an opinion and intention as "insidious." What are the facts in Mr. Laws' possession? The disgrace of the management. Ask any local authority, I have heard, and know it. The first meeting I attended was on June 24 last. The number of shares was 271*l.*; the relinquishments sent in in the previous six months were—W.A. Thomas, on behalf of John Thomas, 100*l.*; C. J. Furlonger, 70*l.*; Alfred Laney, merchant, Redruth, 20*l.*; John Michael Williams, banker, Redruth, 50*l.* The present number of shares is 2374. I deny his assertion that the report of Captain Hosking was obtained in the interest of the mine; it was in the interest of Mr. Laws and the secretary. The report itself is nothing but what was known before, and if people consider, the facts condemn the mine conclusively. As to Mr. Laws' imputation of motives, I treat it with contempt. That my shares cost little I admit, but that little was all too much, amounting to some hundreds of pounds, alike valueless when I bought as they are now.

As to Wheal Union, this mine was purchased at a general meeting in Dec. 1869, for the sum of 480*l.* The shareholders present represented 331 shares out of 5310. How many of the vendors were buyers will probably be known shortly through the Stannaries Court. Cost is incurred in Wheal Union, and the shareholders of East Carn Brea are paying it. Can any number of shareholders compel those who never agreed or signified their assent to increase their risk and loss? Certainly not; it is so well known, and patent to everyone, but the unscrupulous and insidious."

Cost was incurred in bringing up captains and clerks to attend the meetings

who would be much better employed in attending to their duties at the mine. Mr. T. B. Laws has been in Cornwall canvassing for proxies to prevent my cleansing this Augern stamp, and to substitute an intelligence that can comprehend simple matters of fact without everlasting pestering them. Who pays his cost? Who sent him? Has any secretary a right to canvas for proxies? This will shortly be answered in another mine. I gave Mr. Laws notice of my intention to take away from his office everything in which I held a large interest, soon as such intention was formed. I adhere to it, and will openly and fairly fight it out. My predecessor, Mr. Thomas, enjoys the respect and esteem of all who know him, and over will command it; his generosity and largeness of mind, his openness and truthfulness, are beyond question. Mr. Thomas has lost many thousands in the prosecution of this mine. Mr. Thomas has said to me, "Why not stop it; the branches are too small." Mr. Thomas has told friends of mine that but for Mr. Waddington the mine must have stopped.

H. WADDINGTON.

EAST CARN BREA.

SIR.—Holding a good interest in this mine, I concur heartily in the remarks of Mr. Laws in last week's Journal. Situated in one of the best districts of Cornwall, with Carn Brea on the west and Pen-an-drea on the east, surely the mine deserves a vigorous prosecution. The cross-cut now driving into Wheal Union sett may at any moment cut a good lode, and place the concern at once in an excellent position. The best thing for East Carn Brea would be to convert it into a limited company, raise capital of five or six thousand pounds, and sink both shafts with all possible speed. There would be few better speculations in Cornwall than this.

ADVENTURER.

NORTH TRESKERBY MINE.

SIR.—I am glad to find that "A Cornish Shareholder" confirms the opinion which I hold of Mr. Matthews, feeling convinced that the issue of his pamphlet was for the good of the shareholders, and I hope and trust they will take a more active part in the management of the mine, and see that the officials connected therewith do their duty efficiently; and I beg to call the attention of the shareholders to the reply given by Capt. Pryor to Mr. Matthews respecting the raising of 100 tons or more to pay off the debt referred to by Mr. Treylethan—"I was not going to raise 100 tons of ore to put up the price of shares." As I have no reason to doubt Mr. Matthews's statement, I distinctly say that Captain Pryor should not be allowed to remain on the mine. What would any proprietor say if one of his officials were to say to him that he had no idea of using his exertions to promote the interest of the concern? I presume the answer would be that he should no longer require his services. I trust the shareholders will have a thorough investigation into the manner in which the mine is conducted.

Jan. 24.

IRISH SHAREHOLDER.

NORTH TRESKERBY.

SIR.—How long is it since the Irish and Cornish shareholders in this mine (whose letters appeared in the Journal of January 14 and 21) have seen the late Purser? What a statement made at Wheal Seton meeting—that 100*l.* per month could be saved by carrying out certain work! 120*l.* a year is an important item; so much so that Capt. Thomas, the manager of Dolcoath, was called in to go into this question and look at his report, which was sent to every shareholder. Now another important question—How far will it be before the last new steam-winch erected at West Wheal Seton is wanted? Will it ever be really required? Would it not be advisable for the shareholders here to send in such a man as Capt. Thomas, to go into this and other questions, and to report fully to the shareholders? It must be highly satisfactory to all the shareholders of North Treskerby to know that Capt. Thomas has thoroughly inspected this mine recently for the lords. This is what the manager, Capt. Pryor, has been advocating—that the lords might send in their independent agent, in order that they might not be led astray by false rumours and fictitious reports.

A SHAREHOLDER.

PRINCE OF WALES MINE.

SIR.—I do not see by Capt. Gifford's reports that he has resumed operations in the 55 cross-cut, north of Watson's engine-shaft. Is he afraid to cut a rich lode? Does it not look strange that a cross-cut should have been driven north of the shaft some 60 fms., and cut a branch which has been opened on west of the cross-cut some 20 to 25 fms., and then to start driving still further north, when in the cross-cut there is a large stream of coppery water, which is certainly coming from the lode? Why is it that this important point has been abandoned for the last few months? It looks as if the agents were afraid to cut through the lode, for fear of cutting a good bunch of copper or tin. Surely, the committee of management, or the agents of the mine, ought to have this point accomplished at once. Will Capt. Gifford say why it is not done?

Callington, Cornwall.

A MINER.

[For remainder of Original Correspondence see to-day's Journal.]

ON RECENT IMPROVEMENTS IN TIN DRESSING.

BY J. H. COLLINS, F.G.S.

After a long period of quiescence in stamping machinery, it is refreshing to see that attempts at improvement are at length being made in several directions. The tin obtained by the earliest Cornish miners was probably at first bruised down by hand, and there are evidences of this still to be seen in the neighbourhood of Helston as well as in other places. This rude method was most probably in use until a little more than two hundred years ago, when a member of the Godolphin family invented and applied the first "stamps," which like many at the present time were worked by a water-wheel. The next improvement was the introduction of "fire stamps," within the present century. These were at first met with much opposition, the old tinners declaring that the tin would not be so well stamped, and this objection is still occasionally heard from tinners of the old school. Within the last forty years various minor improvements have been, from time to time, introduced—as, an increase in the weight of the stamp-head, a more rapid motion, rollers to reduce the immense loss of power by friction (these, however, have mostly been abandoned, although it is not easy to say why), &c. Several attempts have also been made, with more or less success, to *grind* the stuff, instead of *stamping* it, especially to grind the "roughs."

Within the last eighteen months, however, a great amount of attention has been given to the subject by several engineers of eminence. The first idea seems to have come from America, the first "pneumatic stamps" having been invented there. These stamps were then improved upon by Mr. Husband, of Hayle Foundry. A trial of one of his improved stampers, consisting of one head, the head and lifter together weighing 240 lbs., took place at Hayle Foundry, on the 21st of April, 1870, in the presence of Capt. Quennell, of Trumpet Consols; Captain Harris, of Great Wheal Vor; G. Eustice, C.E., and other gentlemen interested in mining. The stuff used was from Great Wheal Vor, the usual hardness and size of the stuff stamped at that mine, which is believed to be about equal to the average of the county. The stamper worked without intermission, giving 180 blows per minute. The quantity stamped was 21 cwt., which occupied 2 hours 15 minutes, or, equal to 11 tons 4 cwt., per day of twenty-four hours, which is at least ten times the quantity stamped by the ordinary stamps of the county. The working of the machine throughout the trial was in every respect satisfactory, and at its conclusion every bearing was quite cool and in perfect order.

The next attempt originated with Capt. Polglaze, of Goonbarrow Mines, who proposed to apply the direct-acting steam-hammer to this new use. This has been satisfactorily worked out in the patented machine of Messrs. Chatwood and Sturgeon, of Bolton, which machine was tried at Goonbarrow on Dec. 17. A full account of the trial appeared in the *West Briton* and the *Mining Journal*, but the results were briefly as follows—1 ton of the Goonbarrow stuff was put into the machine and stamped through in 37 minutes, including several stoppages from insufficiency of steam. The stuff is a partially decomposed granite, such as ordinary stamps would bring down at the rate of about 35 cwt. per day of twenty-four hours. The machine is, therefore, equal to about 4*l.* stamp-heads under the circumstances of the trial.

Taking into consideration, however, the insufficient supply of steam—a 2-inch pipe being fitted to the boiler instead of a 3-inch, which would be of more than double the capacity—it is probable the machine will turn out to be equal to much more than this. An estimate of the cost of working seems to have been made with either of these machines. It would not be difficult, however, to estimate within a little what quantity of steam was used at Goonbarrow. The average pressure of steam was about 45 lbs. per square inch, the number of blows averaged 100 per minute, and the average length of stroke was 10 inches. The area of the cylinder, filled for the down-stroke, is 113 in.; that for the up-stroke, 85 in.; this gives for the quantity of steam used for each blow 1980 cubic inches, and for the total quantity of steam used 7,326,000 cubic inches, or (say) 4240 cubic feet, at 45 lbs. pressure. The steam lost within the cylinder by condensation would, perhaps, equal the amount saved during the stoppages. This quantity of steam would be yielded by the evaporation of 7 cubic feet of water. A well-constructed Cornish boiler, of 15-horse power, would, therefore, be amply sufficient; and if such a boiler 8 lbs. of water were evaporated by each 1 lb. of coal, the quantity of coal used would be about 57 lbs. per ton of stuff crushed. More coal was used in the trial at Goonbarrow because the boiler-power was less than one-half sufficient; the fires, therefore, had to be continually forced, and much of the heat went up the chimney; a large amount of priming was, of course, another result of the inefficiency of the boiler for the purpose.

Another direct-action steam-stamper is now being constructed by Messrs. Willoughby, of Plymouth and Redruth, which is shortly to be tried at Wheal Uny, while Mr. Husband's patent atmospheric stamps will be at work very soon at a mine in the vicinity of St. Columb.

Still another machine of the same kind is already at work at the Gawton Copper Mines, near Calstock; it consists only of an 8-inch cylinder erected perpendicularly, with covers, stuffing-boxes, and piston-rods at each end. The lower piston-rod is 3 inches in diameter; this the stamp head is attached, and works in a cover with gratings, as usual. The upper piston-rod is 1*l.*-inch in diameter, and carries a projecting clamp, which sets the slide-valve in motion. This very simple stamper gives from 40 to 160 blows per minute, the power of each blow being calculated by the inventor at 20 cwt.

Mr. Dingey's "pulveriser" does not come into competition with these machines, but is rather an auxiliary to one or all of them, as it is intended to *grind* the "roughs." In former pulverisers tendency was observed in the grinding parts to wear into deep circular grooves, which proved a great drawback. In Mr. Dingey's pulveriser this is impossible, as the grinding surfaces are continually changing their position with regard to each other. Four cast-iron plates of 2-feet diameter are made to revolve rapidly within a circular dish of 6 feet, which moves slowly in reverse direction. The stuff enters in the centre of the machine, and is carried between the grinding surfaces by means of a number of grooves cast in the upper and smaller discs. As soon as the stuff is sufficiently reduced it passes out through a number of stamp grates fixed in the edge of the lower revolving dish. The motion is conveyed from the driving-engine by a belt, while the discs are made to revolve by toothed gearing.

It is certainly a sign of health that so many new plans are being tried, and it is satisfactory to hear that the Royal Cornwall Polytechnic Society has so far approved of three of the plans, those of Messrs. Husband, Chatwood and Sturgeon, and Dingey, as to award to each their first-class silver medal.

THE TREASURES OF NEW MEXICO.

Your readers are already familiar with the main features of the astonishing discoveries of silver in the Burro, or "Jackass" district, a region of country where there is neither soil nor water, situated between the Burro and Chiricahua ranges of mountains, just off the usual route from Mesilla, on the Rio Grande, to Tucson, the capital of Arizona. The ore consists chiefly of blue and black sulphurates of silver, and is also rich in gold, assaying from \$40 to \$2500 per ton. The three principal ridges of ore are 50 ft. wide, and project above the surface from 40 to several hundred feet high. When the news of the rich "strike" reached Tucson, and was confirmed, nearly the entire population, including Gov. Safford, Sylvester Mowry, Coles Bashford, and a few Mexican women, went out to the mines to fix locations. The following are the names of the principal locations on the big croppings. On what appears to be the longest outcropping ledge, which is over two miles in length, the locations are, consecutively—Apache Chief, Freestone, Safford, Capital, Mustang, Harpending, Valley, Kate, Minnesota, Kentucky, Mohawk, Monte Grande, Salina, Forest, Bowman. This lode is known as the Harpending lode. The Brown lode comprises the Mohawk, Ophir, Roberts, Brown, Harris, Brown, Jackson, Potosi, Lee, Jefferson, and Washington locations. The Arnold lode takes in the Dip, Dunn, Arnold, Cooper, Eclipse, and Getty. A magnificent location of 1200 ft. was named in honour of General Thomas, who had promptly furnished the party with escort; and an adjoining location of 400 ft. was named for the noted pioneer, John Thompson. A few words concerning this well-known western man may be read with interest. He crossed the Plains in 1843. From Oregon he went to California, made a trip to the Sandwich Islands, and returned to San Francisco to build the fourteenth house erected in that city. One of Thompson's neighbours tried about the time to sell him a ranche a little way from town for \$1500, \$500 cash and liberal time for the balance, but he declined. That ranche, or rather the ground where it was, is worth today between \$7,000,000 and \$8,000,000. Thompson has had his ups and downs, like all old Californians, and all his old friends, among whom he includes General Fremont, will rejoice to hear of his good luck at last. The location was made in his name for him by his nephew.

The town of Ralston contains several hundred inhabitants, but progress, except in a speculative way, must be slow, as there is not water sufficient for mill purposes near the mines. The Gila River, 25 miles distant, affords the best opportunity for the erection of stamp-mills. The grade is good from the mines, and it is probable a railroad will be built after a few hundred tons of ore are crushed, to prove its value. As it is now, the ore, if selected, can be hauled to the Gila, and made to pay largely: \$500,000 will build and stock this road; another \$500,000 will put up six 40-stamp mills on the Gila; and this \$1,000,000 will be undoubtedly returned to the investors within 12 months after the mills and road are completed. The Burro region is not a country for a poor man, and those who have come here have literally had "a hard road to travel." Until mills are erected, a quartz country, in an agriculturally barren region, is the worst of all bad countries for a man without money.

It intensifies the excitement concerning the mines of this section that several square miles of country at Cienega have been discovered to be extremely rich in chloride ores. These ores were what brought White Pine into such favour as "the poor man's country," for chloride ores are nearly as easily taken out as tough clay, and they are readily worked in the mills. They produce from a few hundreds to many thousands of dollars per ton. Two men can pick out a ton of chloride in a day, when favourably situated for working, and would not be long in making fortunes while the chlorides last. The "country rock" is here, as at White Pine, limestone; and I may add that the position and general appearance of the mineral deposits of the two sections are analogous, though these are far more extensive. Some of the ore here has over 80 per cent. of its weight in pure silver. The district has been named the Chloride District, and a town called Silver City is fast building. At Pinos Altos, 10 miles from Silver City, gold placers have been recently discovered. The Cienega is about 40 miles from Ralston, and is a fine stream, sufficient to supply two steam stamp-mills. The mountain ranges through these sections of New Mexico and Arizona are the same as those which, southward in Chihuahua, Sonora, and Durango, have yielded such immense amounts of silver for centuries, and as those which, still further to the north, in Nevada and other territories, are proving so exceedingly rich. The Carmen vein, in Chihuahua, has produced enormous quantities of silver. Three masses of malleable silver, in a pure state, were once taken from this vein, together weighing 870 lbs.

The mines of Santa Eulalia, in Chihuahua, a short distance to the south of this place, are the most northern mines of any in Mexico which have been worked with regularity. By the richness of their ores they have proved the superiority of the northern mines of Mexico

over the mines of Central Mexico. There the profitable portion of the ledge is at a great depth; here the ledges crop out rich at the surface. This confirms Humboldt's theory in respect to the deposits of silver ore in Northern Mexico—that the proportion of silver in the ore would be found to increase toward the north. This is accounted for, geologically, by the dip of the veins, the rich portion of which, being near the surface at the north, recedes from it as the ledges tend southward, until, in Central Mexico, it is often found only on descending thousands of feet on the vein. The great mineral treasures of Mexico may, therefore, be said to commence at the point where Humboldt states that the labours of the miners had terminated. The Gadsden Purchase comprises the territory of which I am now writing, and originally formed part of the Mexican States of Sonora and Chihuahua.

The discovery of these mines will be a very strong argument for the building of the Southern Pacific Railroad on the 32d parallel route. The main argument for the 35th parallel was its agricultural advantages, but they will be overbalanced by the rich mineral region on this line. In gold, silver, copper, and argentiferous lead ores this section of our country cannot be excelled. All it needs is the helping hand of capital to make it productive. The immigration hither promises to be so large that it is not likely that the Indians will be dangerous a year hence. Within three months New Mexico will undoubtedly have enough people in its mining section to protect themselves, and it will, probably, soon be admitted as a State. The native inhabitants, most of whom are Mexicans, are a lazy, good-for-nothing set, who subsist chiefly on corn-bread and beans, go to church regularly (the women I mean), pay the priests liberally, and educate their children carefully in the arts of chicken and bull fighting. A sensation is occasioned once in a while by the Apaches making a descent, and gobbling up a party, killing the men, and carrying off the women, if young, into captivity. The Bishop of Santa Fé, while on route recently from La Paz, Arizona, was attacked by Apaches, and has a very narrow escape. The desperate bravery of two Frenchmen in his escort alone saved him. They were after a lock of the bishop's hair, and nothing but the defence of those men saved his scalp. Missionaries are no more exempt from danger among a great many of our hostile tribes than the hardy pioneer, who is constantly watching for Indian "sign," and who knows from experience that no white man is safe, except when on a Government reservation.

Ralston, New Mexico, Nov. 18.—*New York Tribune.*

FOREIGN MINING AND METALLURGY.

In connection with the orders given out by the Belgian Minister of Public Works for rails and plant for the Belgian State Railways, we should have stated last week that the Haine St. Pierre Construction Workshops Company has received an order for one locomotive at 2000t. The amount of the orders given out is altogether as follows:—Locomotives, 62,000t.; carriages and trucks, 31,152t.; rails, bolts, and cramps, 174,179t.; wheels for carriages and trucks, 9037t.; axles for carriages and trucks, 3057t.; piston buffers for carriages and trucks, 5280t.; grease boxes for carriages and trucks, 5213t.; tyres, 9000t; total, 298,899t. As regards the rail contracts comprised in these orders, we may state that Messrs. Cockerill & Co., of Seraing, will supply 3000 tons of Bessemer cast steel Vignoles rails, at 34,764t.; the Marcinelle and Couillet Company, 3390 tons of iron Vignoles rails rolled by ordinary processes, at 23,391t.; MM. de Dorlodot Frères, 3390 tons of similar rails, at 23,391t.; MM. Blon diaux and Co., of Thy-le-Château, 2404 tons of similar rails, at 16,591t.; the Montigny-sur-Sambre Works Company, 2404 tons of similar rails, at 16,591t.; the John Cockerill Company, 2231 tons of similar rails, at 15,393t.; the Sclessin Company, 2292 tons of similar rails, at 15,818t.; the Monceau-sur-Sambre Company, 1673 tons of similar rails, at 11,544t.; the Zone Company, 805t tons of similar rails, at 5528t.; and M. Boucneau of La Louvière, 595 tons of similar rails, at 4105t.

The state of the Belgian coal trade has not experienced much change. Stocks are still being accumulated, but, nevertheless, prices remain firm. Rolling stock still makes default on the railways, but the Minister of Finance has presented to the Chamber of Representatives a Bill granting to the Department of Public Works a credit of 260,000t. for the construction of additional engines, trucks, &c. It appears that in October Belgium imported 16,084 tons of coal, against 13,979 tons in October, 1869. In the first ten months of 1870 the imports were 184,923 tons, against 190,080 tons in the corresponding period of 1869. Of coke, Belgium imported 7294 tons in the first ten months of 1870, against 6203 tons in the first ten months of 1869. The exports of coal from Belgium presented a great falling off in October, having amounted in that month to only 119,657 tons, against 351,997 tons in October, 1869, showing a decline of 232,340 tons. In the first ten months of last year, however, the aggregate exports were 2,829,103 tons, against 2,897,856 tons in the corresponding period of 1869. These figures show a decline of only 68,753 tons to Oct. 31 last year, but the last two months of the year promise to seriously modify the returns for the whole twelve months. The exports of coke from Belgium in October amounted to 27,854 tons, against 62,984 tons in October, 1869, showing a decline of 35,130 tons. The first ten months of 1870 showed coke exports from Belgium to the aggregate amount of 536,378 tons, against 545,042 tons. As regards the value of the coal exports last year, the returns to Oct. 31 show a decline of 41,252t., as compared with the corresponding period of 1869.

The last advices from Havre represent that Chilean copper maintained a good tone upon that market; about 26 tons of Corocoro mineral had been sold at 68t. per ton, Paris conditions. The last quotations received from Marseilles are as follows:—Toka, 80t.; refined Chilean and Peruvian, 80t.; rolled in sheets, 84t. per ton. The German copper markets have continued extremely quiet; the extreme difficulty of transport considerably checks transactions; but the article has sustained former rates tolerably well. Tin has been held with firmness in Germany; some of the German markets have not varied. At Marseilles lead in saumons, first fusion, has made 18t. 16s. per ton; second fusion, ditto, 17t. 8s. per ton; in shot, rolled, and in pipes, 20t. 16s. per ton. Upon the German markets there is no variation to report in lead. At Rotterdam, Stolberg and Eschweiler have made 11s. fls. and German of various marks 10t. fls. There is scarcely any change to notice in zinc.

It appears that in the first ten months of last year 4000 tons of steel of various descriptions was imported into Belgium, as compared with 3807 tons in the corresponding period of 1869. The imports of minerals into Belgium in October were 35,466 tons, against 47,289 tons in the corresponding period of 1869; for the ten months ending Oct. 31, 1870, the imports attained an aggregate of 189,070 tons, as compared with 473,938 tons in the corresponding period of 1869. The imports of iron of various kinds in the first ten months of last year were 78,256 tons, as compared with 54,020 tons in the corresponding period of 1869. The exports of steel of various kinds from Belgium attained an aggregate in the first ten months of last year of 372 tons, against 90 tons in the corresponding period of 1869. The exports of minerals from Belgium in the first ten months of last year were 153,843 tons, against 138,714 tons in the corresponding period of 1869. The exports of rails from Belgium presented a sensible increase in October having amounted to 8222 tons, against 10,736 tons in October, 1869. For the first ten months of last year the rail exports of Belgium also presented a decline, having been 114,754 tons, against 124,453 tons in the corresponding period of 1869. The exports of plates from Belgium in the first ten months of last year showed an increase of about 1600 tons, as compared with the corresponding period of 1869. Altogether the exports of iron and steel of every description from Belgium amounted in October to 20,130 tons, as compared with 20,639 tons in October, 1869, the aggregate of the ten months ending Oct. 31 last year having been 222,179 tons, against 238,339 tons in the corresponding period of 1869, showing a decline of 16,160 tons. These figures forcibly illustrate the sad effects of the war on Belgian metallurgical industry; and the gloom indicated in affairs will only be deepened, it is to be feared, by the publication of the returns which will shortly make their appearance for November and December. As regards the current condition of Belgian metallurgy, the orders given out for the State lines will assure the various works a certain amount of employment for some time to come. Of the 222,179 tons of iron and steel of all kinds exported by Bel-

gium last year 60,979 tons went to Russia, 45,317 tons to the Zollverein, 23,120 tons to the Low Countries, 11,158 tons to England, 29,469 tons to France, 17,252 tons to Turkey, and 10,131 tons to the United States.

The production of iron in the United States appears to be largely on the increase. Pig-iron was made in 1869 to the extent of 1,916,641 tons—anthracite pig-iron, 971,150 tons; bituminous coal and coke-made pig-iron, 553,341 tons; and charcoal-made pig-iron, 392,150 tons. In 1865 the aggregate production of pig-iron of all kinds in the United States was 931,000 tons. The production of the American rail mills in 1869 was 593,586 tons, while in 1865 it did not exceed 356,292 tons. The production of the American rolling-mills other than rails also amounted to 612,420 tons in 1869. The United States are thus evidently making strenuous efforts to meet their own requirements in the matter of iron.

A "blast" of 27 tons of powder was recently successfully exploded in the Blue Point Gold Mine. Three millions of cubic feet of gold-bearing earth was lifted 20 ft., and shattered into atoms.

MINING IN AUSTRALASIA—MONTHLY SUMMARY.

A Bill is being passed through the Assembly giving facilities to certain persons from Melbourne to search for gold in the Murray Flats.

An application from Melbourne gentlemen for leave to prospect for coal and oil in South Australia has been favourably entertained by the Ministry.

The English, Scottish, and Australian Chartered Bank has forwarded to Melbourne for transhipment to London 3097 ozs. 13 dwts. of South Australian gold.

The gold mining news generally this month is flat, although at Barossa there have been some moderately good finds.

The line of the pumping-engines at the Burra Burra Mines have been re-lit, and it is expected that the workings will be regularly commenced very shortly.

A discovery of native sulphur has been made near Echunga.

A bonus of 2000t. has been granted to encourage the manufacture and export of an indigenous fibre of proved value for paper-making.—*South Australian Register.* Dec. 6.

A seam of rock salt, 4 ft. thick, has been discovered near Scone, and is about to be worked. A lease of the land has been bought by Dr. Creed. This is the first instance of salt being found in the colony. I think I am correct in stating it to be the first in Australia.

AUSTRALIAN GOLD MINING.—The Melbourne papers report an improvement in the gold-mining industry in the colony of Victoria. The Ballarat correspondent of the *Melbourne Argus* writes:—"The singular success that has attended that grand old mine, the late Band of Hope—now the Band and Albion Consols—since it was in its alleged death throes, and had to be let on tribute, is a most gratifying feature in our late improvements in mining." The accounts from the Sandhurst district, second in importance to Ballarat only, are very favourable, more especially as regards the old-established companies, many of which are returning very good yields. Another large district, the Ovens, is also furnishing satisfactory returns. Fresh rusher are constantly being reported in the Berlin district, the country of big nuggets, while from the old ground at Berlin nuggets of large size are found repeatedly. On Nov. 21 a fine nugget, weighing 68 ozs., was got in Schlossman's claim, John's paradox. Berlin. In reference to the 221-ounce nugget obtained the previous week in Cattlin's ground it appears from the Ingoldwood Journal that this is the largest which was found only selected for the first time on the 8th of the preceding month, after which date only about eight days' work was done when the "spick" was found. Among other matters reported from Berlin is the finding of a 38-lb. nugget about the middle of last month; but it has been surpassed by accounts from the Dinnolly district, where a nugget weighing 47 lbs. valued at 2000t. was obtained by Broderick and party. Only a few days previously a nugget 57 ozs. 6 dwts. was unearthed at the Grindmill in the same district. The *Ararat Advertiser* reports that "the rush at McNab's Gully continues to yield capital returns to the few miners on the ground. On Friday one man there unearthed the largest nugget that has been seen in the district for years past. It weighs 35 ozs., and is a fine specimen of gold. A few days previously another nugget, weighing 17 ozs., was obtained; indeed all the gold from this little diggings is of a coarse nuggety quality. Judging from the large space of likely ground, we should say there is room for a good many more miners."

AUSTRALIAN MINES.

YUDANAMUTANA (Copper).—Adelaide, Dec. 6: The superintendent states—"I have arranged at once to carry out your instructions as to shipping from this side about 1 ton of our burrows, and a keg of the water now coming in at the 50. We are now working only upon carbones and oxides on the upper levels, and have only two furnaces at work. Our mining operations are confined to stripping and stopping down old workings. We are doing in driving or sinking, but, as it were, lying upon our ears until the main shaft is completed, which I fully expect will take until June or July next to get down to Hill's lode; and until this is done very little profit, if any, will be made from our other workings, unless in sinking the main shaft we are fortunate enough to cut through any good deposits." I have also contracted for the next six months to supply the furnace with wood at 8s. green and 9s. dry, as against 9s. 6d. 1½s. previously. A saving of at least 3s. per ton of copper made, also, reduction in cartage up and down to 12. 10s., being a further saving of 11. 10s. per ton on copper made; and by next mail I hope to report a contract having been made to supply the works with clay at one-half the cost of the past. I have also succeeded in obtaining from the copper company a permanent reduction of return charges, amounting in all to 17s. 2d. per ton.—Great Augustus Railway: The Government is bringing in a Bill at once, and prior to the completion of the surveys; much valuable time will thus be gained.

Capt. Terrell reports, under date Nov. 28: Blinman Mine: The new shaft was holed to the back of the 10 fm. level during the week, and I am prosecuting this necessary work with all possible speed. I must request you to excuse this short report, as you are aware that by merely stripping and stopping in the old working nothing nothing fresh can be discovered; and as to the splendid lode at the bottom of No. 7 winze, that is quite out of our reach until the shaft is down, and we have the requisite machinery. We have another kind of fire-stone, which we are crushing for bottoms of the furnaces, and for which we pay only 1s. per ton, in place of 2s. for the sand which we formerly used; and, as we find that the new stone stands better than the sand, this is a great saving. Ore raised and smelted from Oct. 31, 190t. tons; copper made, 19 tons 10 cwt. 3 qrs. Port Phillip and Colonial (Gold).—The directors have advised from their resident director at Clunes, dated Dec. 2. The quantity of quartz crushed during the four weeks ending Nov. 9 was 4839 tons; pyrites treated, 87 tons. Total gold obtained, 1574 ozs. 6 dwts., or an average per ton, including pyrites gold, of 6 dwts. 12 grs. The receipts were 5948L; payments, 3312L; profit, 2636L, added to which was last month's balance of 520L, making an available balance of 3156L. The amount divided between the two companies was 1000L, the Port Phillip Company's proportion of which amounts to 650L. The balance (3156L) was carried forward to meet contracts for firewood and mine timber. The return for the three weeks ending Nov. 30 is as follows:—Quartz crushed, 3622 tons; total yield of gold, 1068 ozs. 5 dwts., or an average per ton, including pyrites gold, of 5 dwts. 21 grs., being 5 grs. per ton better than telegraphed. Remittance, 650L.

PORT PHILLIP AND COLONIAL (Gold).—The directors have advised from their resident director at Clunes, dated Dec. 2. The quantity of quartz crushed during the four weeks ending Nov. 9 was 4839 tons; pyrites treated, 87 tons. Total gold obtained, 1574 ozs. 6 dwts., or an average per ton, including pyrites gold, of 6 dwts. 12 grs. The receipts were 5948L; payments, 3312L; profit, 2636L, added to which was last month's balance of 520L, making an available balance of 3156L. The amount divided between the two companies was 1000L, the Port Phillip Company's proportion of which amounts to 650L. The balance (3156L) was carried forward to meet contracts for firewood and mine timber. The return for the three weeks ending Nov. 30 is as follows:—Quartz crushed, 3622 tons; total yield of gold, 1068 ozs. 5 dwts., or an average per ton, including pyrites gold, of 5 dwts. 21 grs., being 5 grs. per ton better than telegraphed. Remittance, 650L.

ANGLO-AUSTRALIAN (Gold).—The directors have received the following advices from Victoria:—Mr. Kitto writes, under date Fryerstown, Dec. 5:

"The works at the mine are progressing very favourably. In the 2nd engine-shaft a vein of quartz has been struck at a depth of 90 ft., containing gold; the thickness of this layer is about 15 in. The whole of both consignments of machinery, ex Merrie Moore and Mikado, has arrived and is in good condition, except the piston of the 25-engine, which had to be taken to the local foundry for the purpose of being fitted with rings. The engine-house is nearly finished; the bob is in position, as also are the cylinder and bell-work." Capt. Ralsk writes, under same date:—"I have the honour to report progress since the 7th ult.—No. 2 Engine-Shaft. West: The water is bailed out, and the shaft cleaned up on the 10th; depth of shaft, 66 ft. 6 in. from present bottom. We commenced to sink through a flooan underlying west (about 3 ft. in the fathom) from 4 to 6 ft. in width, with broken quartz on the west side; from 66 to 95 ft. sunk through a beautiful channel of ground, with small leaders of quartz at intervals. At 95 ft. we struck a leader 18 in. thick on the west side of shaft, in which gold was freely seen in breaking stone; this leader, I may mention, is highly payable; present depth of shaft, 104 ft. The engine and boiler house is finished, so far as the mason work is concerned. The stack will be finished to day, and the outside loading will be completed in the course of eight or nine days. All other works progressing satisfactorily." The following is an extract of a letter from Mr. Lamb to one of the directors. "It is a little cheering to that we have the Anglo Company, because there we have sufficient capital to develop the mine, and past experience has taught us to get depth before opening out on any scale. You will be pleased to hear that in the western shaft the week before last, at a depth of 93 ft., the men struck a beautiful vein of quartz 18 in. thick at the lowest end, rich in gold and mandise. It is impossible to say what it would take to go to the ton—several ounces most likely; at any rate, without examining the small heap, (say) 1½ ton. We have specimens containing from 5 to 7 dwts. altogether; if this makes a large body we shall get it in one cross-cut when we are deep enough to open out. I have no fear of this property not turning out well, and recommend you and the other directors to have the same faith."

AUSTRALIAN UNITED (Gold).—The directors have advised from the Duke of Cornwall Mine, dated Fryerstown, Dec. 5: Mr. Kitto writes—"The underlie of the lode in the 250 ft. level, in the Duke of Cornwall Mine, is so very rapid that, although a distance of 100 ft. has been driven from the shaft, the water will not be available for the engine until the 250 ft. level is reached. The water is raised by a pump, which is 174 ozs. 11 dwts. 18 grs., on which we have received advances amounting to 6771. 13s. 10d. sterling." The following is the report of Captain Williams to Mr. Kitto on the Duke of Cornwall Mine, dated Dec. 5: "I beg to hand you a report on the progress of the Duke of Cornwall Mine for the past month. The 252 ft. level, at Danes' shaft, is now 103 ft. from shaft. I presume in my last, and judging from the underlie of the lode in the 84 and 133 ft. levels, that we should have cut the lode the lode in this level are this; but I saw finds, in sinking a winze on the lode in the 200 ft. level, that the underlie has greatly changed—from about 1 ft. in 3 ft. to 4 ft. 6 in. in 6 ft.—which, if continuous, will necessitate our driving another 80 ft. to intersect it, which will probably take eight weeks more. I inspected Howe Brothers' claim a few days since, and find that at their deepest level the underlie is precisely the same—4 ft. 6 in. in a fathom. We have been crushing stone (a few tons) from the north stop in the 200 ft. level, with payable results."

ENGLISH AND AUSTRALIAN (Copper).—The directors have advised

from their manager, dated Port Adelaide, Dec. 7. The quantity of coal at Port Adelaide was 1040 tons. There were two furnaces roasting, one smelting, and one refinery at work at the port. Since the date of last advices about 232 tons of copper had been shipped, inclusive of the 160 tons advised as ready for shipment by last mail.

SCOTTISH AUSTRALIAN.—The directors have advices from Sydney, dated Dec. 2, with reports from the Lambton Colliery to Dec. 1. The sales of coal for November amounted to 12,468 tons. Mr. Morhead reports that the experimental operations in quartz crushing at the Cadia properties had not, so far as they had gone, realised Capt. Holman's expectations.

FOREIGN MINES.

ST. JOHN DEL REY.—Dec. 17: Morro Velho produce for November, 2725 ots. with 407 tons ore, yield 2·544 ots. per ton.—Morro Velho cost for November, 4184L: loss for November, 252L. Morro Velho produce eight days of December, 2723 ots. with 2·371 ots. per ton.

DON PEDRO.—Mr. F. S. Symons reports for November:—Produce, 8301 ots., at 8s. 6d. per ot., 3527L; Cost, 3048L; profit, 479L. The produce has increased principally owing to an improvement in the auriferous quality of the lode at Alice's west, which has at times given even poor-box work samples, and though no continuous defined "line" has yet been discovered the channel of ground worked on shows a marked improvement that we hope soon to have the pleasure of reporting that a rich one has been struck. Little has been broken from the bottom of the mine, nor can be until the cross-cut (to be commenced in December) from Vivian's shaft has drained the stopes. Extract from letter dated Dec. 17.—Produce weighed to date, 1018 ots. (There is evidently a mistake in these figures—1018 ots.—as the gold cleaned up to Dec. 12—1050 ots. is included in the above remittance.) Nothing new since my last. No box work, but fair strike work from Alice's west. Our stakes principally supplied from this section. Very little broken from the bottom of the mine.

Telegraph.—Weighed to Dec. 30, 4490 ots.; estimate for month, 5590 ots.

ROSSA GRANDE.—Mr. E. Hildeke reports for November:—During the month 116 tons of ore have been treated from this mine, and yielded 1606 octavas, equal to 13·8 ots. per ton. And for the first division of December he adds—Little or no change has occurred since my last in the appearance of the lode in the 40 fm. level west; that in the stopes below the 50 fm. level is opening out again, and the auriferous quality of the stone is likewise improving. Taken on the whole, I am pleased to say the features of the mine are more favourable than last month.

ANGLO-BRAZILIAN.—Mr. F. S. Symons reports for November:—Produce, 2052 octavas, at 9s., 923L; cost, 1408L; loss, 483L. Stone has fallen off in auriferous quality, and produce less than in October; but, though such is the case, I am unable to report diminution in size of lodes about principal points in operation.

GENERAL BRAZILIAN.—Capt. Thos. Treloar, reports for November:—Taking the operations generally, a fair amount of work has been done, though the weather has frequently been very unfavourable. Some gold could be extracted at once, but doing so would, I fear, be disadvantageous to the true interests of the company. The right sort of force is now appearing in satisfactory numbers, and this fact, coupled with offer of coolie labourers, settles the question as to force.